

attend to it. It is additions, etc., to what I wrote four years ago.

If you understand me, my meaning is this, I wish you to mention to Mr. M. in a casual way that you find by a letter from me that I have sent an additional letter for that work in which case he will enquire for it of Dr. L., should Dr. L. through hurry, have neglected it."

The following letter from Jenner to Spalding explains itself. As I have said before, it deals with one of the earliest shipments of vaccine to America:

"Dear Sir:

From the time I rec'd your communication relative to the sailing of the ship to America, to the present hour, I have met with such incessant interruptions that I c'd not get my parcel ready for Dr. Waterhouse till now.

I have written a long letter, or rather a long incongruous scrawl—the Dr. perhaps little knows the harassing kind of life I lead here—I wish you w'd in some measure explain it to him that it may prove an apology for my incoherent letter. I have sent some Vac. matter to the Dr. Perhaps you made the request for yourself. If so, pray let me know it.

Yours very faithfully,

E. JENNER.

Tuesday night."

The pressure under which Jenner carried on his correspondence is well shown in another letter of his to Waterhouse, which is published in the latter's "Information, etc." (Cambridge, 1810, p. 52). There he says: "And now, my good doctor, I would fain proceed further and double my epistolary account with you; but our friend Spalding tells me that if I do not make haste, the ship intended to convey this will be gone. I have not said half I wish to say—but I am at this moment fifty letters behind-hand with my correspondence—a distressing idea." If only he could have had a stenographer and a typewriter!

We know from Baron (p. 386) that this correspondence between Waterhouse and Jenner was kept up with increasing interest and attachment until nearly the close of Jenner's life. Such friendships between scientific workers who have never met are beautiful and, I believe, represent humanity at its best.

177 Post Street.

Why Worry?—"Worry," says Herman N. Bundesen, "is a waste of time and energy, accomplishes nothing, and gets nowhere. Worry creates a surly temper and an habitual grouch. It puts a damper upon ambition and is a wet blanket upon happiness. It's a 'joy-killer.' Worry gives a jaundiced look on things, disturbs mental balance, and lowers resistance to disease. The life of the worrier is just what he makes it—an unbalanced existence. The remedy for worry is cheerfulness, and this is to be found in planning good things for the future, living more contentedly in the present and not at all in the past, having more faith in God, talking less, listening more, keeping occupied, and cultivating optimism. Look at the doughnut, not the hole."

Reorganization Meeting of the State Medical Society of California, October 19, 1870—It was for such purposes this society was formed: To bring the members into harmonious unity of action; to cause mind to bear on mind; to work out the problem of climatic influences on the physical condition of man; to investigate the nature and causes of endemics and epidemics; to determine the best methods of holding life and health in integrity, and to remedy the evils incident to existence—these I conceive to be its prominent aims. (From Address of Welcome delivered by Thomas M. Logan.)

SOME HISTORICAL INCIDENTS IN THE DEVELOPMENT OF THE OPERATION FOR CATARACT

By HANS BARKAN, *San Francisco*

IN OUR attempt to describe and bring forth the relation to each other of the main developments of the operation for cataract, we find that we are asked to include a period of two thousand and more years. The development of the operation to its present very nearly perfect state was dependent upon the natural development of knowledge during the course of this period, partly upon the development of certain specialized forms of learning, and partly upon emancipation from prejudice and bigotry.

The literature on the subject is immense, though comparatively little is extant in the *original* Latin or Greek. These writings disappeared long before the time of the Arabians. With the pillage and sacking of cities and the destruction of their libraries, many of the original descriptions of the operation vanished, and it is mainly through the translations into the Arabian that we are still able to obtain very nearly first-hand knowledge of what the ideas of the Romans and Greeks were.

In our appreciation of operating methods and of general knowledge appertaining to cataract among the Greeks and Romans, we must not forget that translations into the Arabian were not always accurate and were often not from the original Latin, but from various forms of degenerate and colloquial Latin. Furthermore, that the Arabians interpolated their own conceptions of what the original Roman or Greek surgeon may have meant, and that often an Arabian word meaning one thing may have had in the Latin original one of several meanings, and vice versa, so that the translations which we possess of the Arabian manuscripts, English, French or German, give in many cases a different meaning from that which the original Latin or Greek description meant to convey.

A case in point is the question as to whether the Greeks and Romans ever suspected the true nature of cataract. What did they mean by the removal of a cataract? Was not to them any obstruction to sight that was visible within the anterior chamber or within the pupil a cataract? Did they not include hypopion and secondary pupillary membrane? We wonder whether some of the very earliest accounts of the actual removal of the lens from the eye do not refer to an incision into the cornea for removal of a hypopion.

Galen says: "The cataract is brought to another location where it disturbs less, but a few have attempted to empty it entirely." The original of this work is lost, as is the work of Antyllos, which Razi has preserved for us in Arabian and in which it is stated, "I have split the lower part of the pupil and have led the cataract outward. This is possible with the thin cataract, but with the thick it is not possible because the egg jelly moisture would flow out with the cataract."

Hirshberg, who has gone most carefully over the Arabian text, with which language he was familiar, doubts that the leading out or pulling out of the cataract is the sense of the word, but that it is more

apt to be one meaning "pasting it down," and would therefore refer to some method of couching.

We are not in a position to state what may not have been done occasionally and what may not have been done in times long before there exist any records. Celsus, a contemporary of Christ, gave the earliest description of cataract operation, viz., that of couching. Three centuries before the dawn of the Christian era there is historical mention of ophthalmic surgeons in Alexandria, and Galen states that some of these surgeons devoted themselves exclusively to operating on cataracts. Celsus speaks of the writings of a famous Alexandrian surgeon named Philoxenes, who lived 270 B. C.

We have proof, then, of some form of cataract extraction as long as two thousand years ago. That, except for occasional isolated instances, the operation in the main remained the same for many centuries is scarcely to be wondered at. It remained the same in principle in the hands of the Greeks, the Romans and Arabians, and later in those of the surgeons of the Dark Ages of Central Europe.

The knowledge of anatomy of the eye was a most rudimentary one through all this period. No surgeon had any real conception of the nature of cataract, or that the crystalline lens was displaced by the operation. It was held to be an effusion from either the posterior or the anterior liquids of the eye. The rough drawings of ocular anatomy show an entirely erroneous idea of these chambers and of their sizes; the humoral pathology of the time led naturally to the conception of effusion.

So matters stood until Brisseau's discovery of the real nature of cataract, and of Daviel's delivery of the lens through a corneal section, not two hundred years ago. From that time on to the present, the great advances in surgery of cataract have occurred—advances associated with the names of Daviel, Brisseau, Heister, Mery, Maitre-Jean, Morgagni, James Ware, Wenzel, von Graefe, Beer, Wecker, Schweiggert, Arlt, La Faye (the originator of the intra-capsular operation), Richter, Mackenzie, Rosas, des Marres, Pagenstecher, Knapp, Smith, Barraquer and many others.

The technical development of the operation since the days of Daviel has been great; the eminently satisfactory results of today, however, not attainable until cocaine and asepsis had made possible the painless and cleanly performance of the technical improvements.

Let us in the main interest you in three great periods. The first, that of the Arabian methods and schooling; the second, that of the operation as carried on during the Dark Ages in Central Europe; and the next, the epoch-making work of Daviel.

Civilization following the period of "the glory that was Greece and the grandeur that was Rome" had its throne in the East. Bagdad was not only the political capital of a far-reaching empire, but the focus also of all scientific endeavors. There were read with enthusiasm Aristotle and Plato; there the scientific world gathered and there mathematics, and astronomy based on Euclid, were called into life.

Based on Hippocrates and Galen, medicine was advanced and an endeavor made to investigate the secrets of nature. The treasures of the Arabian world in contrast to the poverty of Christian Europe

of the Middle Ages is hard to imagine. The geographer Jaqut in 1200 A. D. found in a small Arabian city twelve libraries, each of 12,000 volumes. Bagdad, a short time before its destruction by the Mongolians, contained not less than thirty-six libraries; the library of its ruler in the ninth century contained 80,000 volumes; that in Cairo, 2,000,000 volumes; that in Cordova, 600,000 volumes. Arabic was the world language. In this language, then, we find the translations of Greek and Roman medicine, and a number of their own medical works, the most famous one perhaps being that of Razi, which kept



Jacques Daviel

its place throughout the Middle Ages and into the seventeenth century, being used as the foundation-stone of many of the university lectures in medicine in Central Europe.

Abul-Hasan, Ali B. Al-Abbas and Ibn Sina are famous names, the latter more familiar to us as the Avicenna of the Latin translations of the Middle Ages. In their writings are to be found many trenchant observations; many of the drugs used today were familiar to them, and their ophthalmological knowledge especially was saner and freer from absurd and filthy methods of treatment than that of their successors.

The Arabians as far as cataract was concerned, did not, however, in spite of their incisive power of observation and deduction, go further than crude methods of relieving blindness. The couching of cataract by means of various shaped needles was the standard method of procedure. Some of their ideas regarding the circumstances favorable for the operation and the method of performing it are interesting.

So says the Persian, Abu Ruh Muh: "Should

someone ask you how one couch the cataract, and how many varieties of doing this there are, so answer, 'One operates the cataract in three methods: first, with a little knife or a needle; second, with a solid lance, and third with a hollow needle.'

Antyllos and Paulos describe it somewhat as follows: "In performing the operation put the patient in the shadow opposite to the sun ball; his head be held tightly; he look toward his nose without deviating from this position. Now let the surgeon put his instrument as far away on the temporal side of the cornea as is the distance between that and the pupil. Let the surgeon take the tail of the needle and press it into the eye so that a mark is left, and taking this spot let him shove inward and forward the needle. Wind a thread about the needle so that it do not penetrate too deeply. Is now the needle in the eye; bring your mouth close to the eye and blow upon the same so that the pupil remain undisturbed. Now press downward, and press the cataract toward the lower part of the eye. Should the cataract be a difficult one and return into place, break it up toward the sides where it seems to you easily disposed of until the patient sees immediately. If this has succeeded, draw out the needle and lay upon the eye egg albumen with rose oil for three days. Lay the patient then upon his back, rub some white salve on his eyes, for they must hurt him. Should only one eye be operated upon, the other one, however, must be bandaged with it. So let him lie and sleep upon his back in a dark room, and be visited frequently and regularly that one knows exactly his condition. Let him beware of singing, talking and coughing. Do not change his bandage for three days if there be no necessity."

The demands upon the operator were: "The cataract operator be of good vision, of a clear, penetrating gaze, of sharp sight, possessed of knowledge of the interior of the eye and of the optics of sight. Let not his hand tremble; let him step toward the eye with courage; let him be fearless when pressing in the needle, and free of dizziness. Let him not be ravenous for operations, and let him choose the best times."

To be ambidextrous was demanded on the part of all the Arabian authors. We know today how valuable an attribute of the cataract surgeon this is. The influence of the seasons and of the time of day were held to be of great importance. A sunny day between autumn and spring was preferred. Says Hippocrates, as quoted by the Arabians: "Let the surgeon wait for twenty days after the mid-point of summer, autumn, winter and spring, during which time the patient should be regular in his diet, and freely move his bowels." Says Ali Ben Isa: "Let the day be one of the northerly sun, not of the southern one. Let him sit opposite to the sun on a cloudless day, and not a day when the sun is not north." Evidently he means a clear, sunny day in time interval between spring and autumn.

The most courageous and best of the cataract operators of the Arabians, Ammar, however, values the time of the year and the state of the weather so little that he does not even mention it.

As regards position, says Ali Ben Isa: "Let the patient sit upon a soft pillow and tie his knees together and against his breast, and also his hands one

against the other and against his thighs. You, however, sit upon a stool so that you are somewhat higher than the patient's head. Bandage the eye that you are not operating."

Says Ammar: "Sit the patient before you, but you so sit so that the head of the patient is opposite your breast. Then command the patient to fold his hands about his knees. If the cataract be double-sided, bandage the left eye." In order to be positive that the cataract rise not again (the dread of the operator), Ammar commands the patient "to cough, to snort, to grind one row of teeth upon the other," all this with the needle still in the eye in order to make sure that the cataract will not rise afterwards. The after-care was done with great precision. On the fourth day the patient was allowed to sit up, but had to be very careful until the seventh. He must avoid chewing and drink little water. He must lie in a dark room as if dead. Ammar changed his bandage every day. On the fourteenth day the patient could take a bath, and after that do as he pleased.

Salah Ad Din adds the following useful precautions: "One should avoid screaming and threshing of wheat in the neighborhood and evil smells and things which cause sneezing. Let his couch be free of fleas and from everything that might disquiet him; nourish him with dates and sour cream; wash his eyes with woman's milk and lay upon them the yellow of egg and oil."

Perhaps we have gone far enough in presenting this picture of the Arabian cataract conception. We see, in striking contrast to the charlatan and degraded practitioner of the Dark Ages of Europe, a group of really eminent, thoughtful and sincere men who had the insight to obey some natural causes, and had an amount of sympathy for their patient's welfare and precautions for his recovery that illustrate the noble and humane sides of the Arabian character.

The couching methods of their time are still carried on today in perhaps even a cruder way by the couchers of India.

The interesting volume of R. H. Elliott on the Indian operation of couching for cataract describes the present day methods: "Their methods are dirty, septic to a degree. Their surgical equipment is carried in a bag or in a box which would be considered dirty alongside of a tool chest or work basket of any English artisan. The filth alike of their clothes, their hands and their person staggers description from a surgeon's point of view." Some of their tricks are quite similar to those employed by the cataract operator of the Dark Ages of Central Europe. The Indian charlatan of today has tricks that even his predecessor of the Dark Ages was not aware of."

Elliott relates the following: "The operator and his assistant took the patient alone into a darkened room; a candle was lighted and kept carefully behind the victim's back by one of the rascals, while the other in front asked if he could see the flame. A sham operation was then performed and the process was again repeated, but this time in front. Naturally the blind man could now see the light and, on being assured that the change was due to what had been done, his gratitude was likely to rise to the production of the necessary fee. If it did so,

the impostor speedily made off. It seems hard to believe that even the Dark Ages were dark enough for so transparent a trick to be tried often in one town." "In India today the patient and operator sit facing each other in a good light. Both squat on their hams in accordance with the immemorial custom of the East. The patient is frequently, if not usually, told that no operation is to be performed; that it is merely a question of putting medicine into the eye. He is requested to look downward, and the coucher raises the upper lid with one hand, whilst in the other he conceals a needle or a sharp thorn; it is said that the needle-like thorn of the babul tree is usually selected for the purpose. In the majority of cases at least it would appear that no form of local anesthesia is attempted. The needle or thorn is thrust suddenly through the cornea and on through pupil or iris into or on to the periphery of the lens. The next movement, which appears to follow the first so rapidly as practically to merge into it, is that of depression or reclination. In nearly every case the operator tests his patient's vision immediately after the operation by holding up fingers, colored cloths, necklaces or other common objects for triumphant identification. The eye is bandaged for at least twenty-four hours. By the end of that time the operator has frequently placed a safe distance between himself and his patients of the day before, and is seeking fresh dupes in another village."

I have brought out these points of the present-day couching operation in India in order to come back to the couchers of the Dark Ages. They traveled with their needle concealed in their broad-brimmed hats or sleeves, and many of them were preceded by a "ballyhoo" artist who, for the week previous to the arrival of the famous doctor, sang his praises in the community about to be visited. Small stages were erected in the center of the mediaeval town square upon which entertainment and sleight-of-hand tricks were performed. Occasionally the charlatan's advance agent consisted of accomplices who praised from the public platform the great man about to come, and declared that they had been blind, and lo! they could now behold the eye of a needle.

The blind came from near and far on the day of the surgical carnival, for not only cataracts but every other blind were relieved of their difficulties. It is true that the operator, as does his modern Indian cousin, did not seek a permanent residence in the town of his activities; but bandaging his patients' eyes for seven days with strict injunctions not to remove the bandage before the time, and being possessed probably of as lively heels as he was of nimble wits, laid a safe distance between himself and his victims.

It is among gentry of this ilk that the famous Dr. Eysenbarth of the sixteenth century belonged, of whom the verse is still sung in Germany:

Ich bin der Doctor Eysenbarth,
Curier die leut nach meiner Art,
Kann machen das die Blinden gehen,
Und das die Lahmen wieder sehen.

Far from the position of dignity which the ophthalmologist among the Arabians enjoys, the ophthalmologist of the Middle Ages sinks to the level of the clever clown and is not held in any esteem by the decent men of his times. They kept whatever

secrets of success they may have possessed either to themselves or offered it for large sums to those who would spend sufficient time as their assistants. They continued the operation in about the form that had existed for hundreds of years, though there were exceptions to which I will come.

Richard Banister in 1622, translating in the main the work of Guillemeau, offers the following poetic views which incline one to believe that he was perhaps not related to the average quack of his times. To comfort the patient he says:

"Like cloudy vapors
See the eyes o'ercast,
Yet vanquished as the dew
By the sun at last."

And again:

"Our practiced, careful skill, with observation,
Will teach the mystery of the operation;
To end this work, that perfect it may stand,
God guide with perfect skill, our eye, our heart, our hand."

And once more, the fit time for couching the cataract:

"Couch cataracts upon a day so fair
That neither wind nor clouds disturb the air;
When spring with simples fills the earth's rich lap,
Or autumn makes the tree put off his cap,
The moon is full, or in conjunction sly,
Or tracing Aries or in Gemini."

The Englishman Banister is the counterpart of the German Bartisch in his superstition, professional narrowness, and envy of his competitors; also in the cleverness of his manual work, in his honesty, in the faithfulness of his presentation and his gift for poetry. Bartisch, whose activities were in the middle of the sixteenth century, has written a book of ophthalmology which gives him the position in ophthalmology of those times that the shoemaker Hans Sachs of Nuremberg held in poetry, or the shoemaker Jacob Bohme in philosophy. At the age of 13 he was apprenticed to a barber and a surgeon; in the year 1588 he was court ophthalmologist, not, however, before the city of Freiberg in Saxony had found it necessary to proclaim that "the eye doctors George Bartisch and Simon Hoffman shall stay at the saddlers' corner in the neighborhood of the market; the other noise-makers, however, shall remain in the middle of the square."

Be this as it may, he was an honest man, and his book, a copy of which is in Lane Medical Library of Stanford University, is well worth study and of great interest. His book is one of the very first complete presentations, *well illustrated*, of ocular surgery.

In this state of chaos, superstition, and lack of knowledge of what a cataract really was, we leave the Dark Ages to find that, as in all other branches of science, knowledge of the fundamentals was necessary before any progress could be made.

The first who demonstrated that the anatomic position of a cataract was in the lens was the famous anatomist of Jena, Werner Rolfinck, who established this fact in 1656. With more generosity than is sometimes found in modern days, he expressly states that he has only confirmed the teaching of Quarre, the Parisian physician and surgeon; and on two occasions has demonstrated the lens to be the seat of

cataract through the anatomical examination of the dissected eye of the dead.

Before him Plempius, in 1632, had spoken of this theoretical possibility, as had the Arabian Arculanus in 1420. As in all development of really proven facts which from this time on occur in rapid strides, the question of priority arises. Men before the days of Rolfinck, Quarre, Brisseau and Daviel had mentioned theoretical possibilities, or had even occasionally stated that they had done this or that; but it is only with these men that the facts were firmly founded, and to them belongs the credit.

Others, such as Borel and Gassendi, maintained that cataract was the opaque lens, but they could not

with this fact established, the first start toward a rational conception of cataract surgery was begun. It is interesting as pointing the way in which discoveries of such magnitude sometimes originate to see in what fashion Brisseau was led to his discovery. Says he:

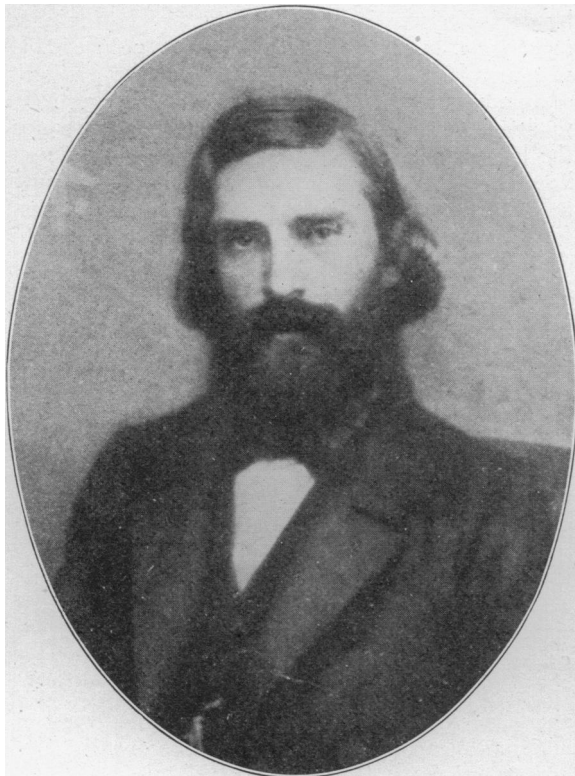
"Nothing was further from my mind than the examination regarding the character of a cataract. I happened to hear that a thief who, in order to disguise his business, had been giving himself out as an *oculist*! was to be executed, and I wished to obtain the cataract needles in his possession which happened to be missing from my instrument case. In obtaining these I was reminded of some doubts which I had entertained previously in regard to the character of a cataract. I made several trials on the eyes of animals and found that I could not advance my needle according to directions from behind forward into the water of the chamber without boring through the lens. This, according to previous ideas, must have destroyed vision, for the current belief was that the crystalline lens was an object absolutely necessary for vision. I awaited my opportunity, which came in the form of a soldier who, possessed of a cataract, died in a hospital. After his death I performed the operation upon his eye. I then dissected his eye and found the lens opaque and hard and pillowed in the vitreous where I had sunk it, and so came to the conviction that the genuine cataract is in no case a skin or effusion produced by the fluids of the eye, but is a hardening and opaqueness of the crystalline lens."

Boerhaave, Morgagni, and Valsalva all supported Brisseau, and the acceptance of the real structure of cataract was soon firmly established. In our day we can scarcely appreciate the psychology of those times, the pertinacity with which the scientific world clung to the revered teachings of Hippocrates, Galen, and Celsus. As little as new ideas in theology met with favor, did scientific truths that were in opposition to the gospel of the old scientific testaments. The establishment of a truth of this sort formed the greatest milestone in the development of the cataract operation of today.

It is noteworthy that in France particularly these new adventurers in the scientific reconstruction of surgery and anatomy flourished, and that only in a later period, after the fall of France as the leading world power, did the German school of great progress in surgical development take place.

As the undisputed leader in the surgical development of the cataract operation of today, we find Jacques Daviel. Daviel had been immediately preceded by operators of great experience and brilliance, such as Charles Saint-Yves, who in thirty years yearly performed eighty to one hundred couchings; the surgeon d'Aigallion of Orleans, who in thirty years was supposed to have had two thousand successes in the operation of couching; Master Antoine, and the Englishman Woolhouse, who in 1717, after practicing for twenty years in Paris, boasted of several thousand cataract operations.

We find with Daviel's time the foundation of the charity hospital in Berlin in 1724, and in 1732, the Academy of Surgery founded in Paris, whose fate it was to hear Daviel and to judge of his claims as



Mr. A. von Graefe

make a breach into the wall of Galen. It required a more violent attack and a more passionate battle to destroy these old teachings, and this hero and victor was the young French physician, Michael Brisseau.

Brisseau maintained in many theses, in correspondence and in popular discussion, that a cataract was nothing but the opaque lens, and the matter was so thoroughly aired and discussed that from then on it was taken as an accepted fact.

Maitre-Jan shares perhaps with Brisseau the credit. He noticed in 1682, in depressing a cataract which appeared in the anterior chamber, that it was not a thin skin or effusion, but a round, thick, white body. He opened the eye of a cataract patient after death and found that the cataract was opaque lens. He performed an examination of the eye that he had operated on after the death of a patient from pneumonia and found the same to be true.

The presentation that he and Brisseau made before the Parisian Academy settled that matter, and

to his new operation. Here, too, the first course of instruction in diseases of the eye and their treatment, held under the auspices of a recognized institution, was given by de la Martiniere, and finally, the foundation of the College of Surgeons in London in 1745.

Two thousand years nearly had passed since the first record of cataract operation. With Daviel we come to a period in which, following knowledge of its anatomic position, ways and methods have been contrived within the last two hundred years whereby we have proceeded to a radical expression or extraction of the lens. Two thousand years of couching became history.

Preceding Daviel, this possibility had been mentioned by Steven Blankaart, but it was left to Saint-Yves and Petit to remove a dislocated lens which, after couching, had dropped into the anterior chamber. They inserted a needle into the cataract and removed it by a short incision through the lower portion of the cornea.

The famous Baron Taylor boasted that he had, in 1737, removed in England, by means of a corneal incision, various cataracts which were behind the iris, but he was disbelieved by several of his contemporaries, and Hope, his countryman, declared, in 1752, that he had seen Taylor operate for six months in Edinburgh and depress several hundred cataracts, but had not seen him remove one from the inside of the eye a single time.

Taylor was undoubtedly a genius; a man as vain and boastful as he was able, and as fluent a liar as he was an operator. His greed for praise and money, and yet the undoubted genius of the man, made him at the time one of the figures of ophthalmology.

The more we read of the predecessors of Daviel the more we come to the conviction that in him is found the first figure both upright, clear-sighted, energetic, brave, persistent and scientific, and that he well deserves to have us feel that he is present in spirit at every cataract extraction, a house god in the home of the ophthalmologist.

He was the son of people of humble station in life, industrious and loyal to their king and to their church. He was born at the close of a century that had been made memorable, not only for what the grand monarch of the age, Louis XIV, with his grand cardinals, had achieved in conquest, in authority, in social display, in religious supremacy, but for what had been accomplished in the advancement of literature, art and science. Painting, sculpture and architecture were in bloom, institutions of learning founded and encouraged, science promoted.

His early life remains in great obscurity. In 1730, at the age of 20, he was attached to the army as student surgeon and served in the army hospitals. When the plague broke out in southern France he was commissioned to go to the relief of the plague-stricken population. In the midst of the plague he married, and on the fifteenth day after his marriage Daviel and his young wife departed for Marseilles, where he again devoted himself completely to the care of the plague-stricken.

Due to his work there he was admitted to the Corporation of Master Surgeons without examination, and was later one of the surgeons at the City Hospital. There had never been official teaching of

anatomy and surgery in the hospitals, and Daviel worked and sacrificed in order that this be made possible. He was given unusual privileges in regard to cadavers and became an enthusiastic student and teacher of anatomy.

It was at this period that he performed his first operation for cataract, using the method of depression which was the only one then known. He immediately became intensely interested in the surgery of the eye, acquiring much skill as a surgeon-oculist, and soon became so skilful that, after having been called to several large cities to operate upon cataract, he came to the great medical center of Paris at the age of 53 in 1746.

Daviel brought depression to a more exact point by devising new instruments and by continuing to make experiments daily on the eyes of cadavers. He was first led to be enthusiastic about the possibility of removing the lens from the eye by having failed to depress a cataract. Failing, he decided to open the lower part of the cornea, and the exact manner he does not describe. After making the opening he held it apart by lifting the corneal flap with small forceps and, introducing a needle into the posterior chamber of the eye, the lens was brought out, followed by a small portion of vitreous body. The eye regained its natural form and saw well. The result was so successful that it gave him, as he says in a letter, "great ideas in regard to the extraction of cataract."

Finally he performed his first predetermined, pre-arranged extraction. The case was that of a woman whose name, age and condition he does not give. He opened the cornea with a small knife, then enlarged the incision with small curved scissors. He then passed a small spatula to the upper part of the cataract and "detached" it, and with the instrument drew it out in small pieces. The pupil appeared clear; there was not the slightest accident, and in fifteen days the patient was well.

Further successes gave him more and more assurance, and finally, in 1750, he had had sufficient experience to cause him to resolve not to operate except by extraction.

The operation which he had invented and now made public consisted in incising the lower part of the cornea and extracting at its junction with the sclera. He first made an opening into the anterior chamber at the extreme lower margin of the cornea with a triangular-shaped knife and then after withdrawing this he enlarged the incision on both sides with a narrow, blunt-pointed double-edged knife as far as he could easily, and finally, when the cornea became too much relaxed to continue the incision, he completed it to the extent desired with delicate scissors which were so curved on the flattened end as to correspond to the curve of the cornea-scleral line. These, of course, were made right and left, the blade introduced into the anterior chamber being blunt-pointed. Having completed the incision, he lifted up the corneal flap with a small spatula and incised the anterior capsule of the lens with a sharp-edged needle. After doing this he carried the spatula between the lens and the iris and delivered the cataract by pressure from above.

Various modifications in the shape of triangular flaps of the cornea were tried by him. In a letter

addressed to the *Journal des Savants* in 1756 he said: "I think no one doubts the excellence of so good a method, for out of 354 persons that I have operated on, 305 were perfectly successful."

Again, in a letter of 1756, he stated that he had, during the preceding sixteen months, extracted eighty cataracts, with only one failure. Even granting that the standard of success was not as high in regard to vision and other desirable factors as today, we must regard these statistics as astonishing. He continued his beneficent work for years, and was called to all parts of Europe to operate.

It was his fortune to be recognized during his lifetime, and to be elected to membership in nearly all

in all its prime essentials. Such an operation is still used by most of us.

It would carry us too far and come too close to modern days and our immediate knowledge of modern surgery to enter into any description of the historical aspects of the times since Daviel. The great von Graefe stands alone in his genial experiments with the size and location of the incision, and with his never-failing efforts to obviate the difficulties of the healing of the wound which originally led him to perform iredelectomy, believing that this obviated infections and trauma to the tissues in the expression of the cataract. His description of his reasons for iredelectomy in cataract extraction and his method are well worth reading in the original, appearing in the *Archives of Ophthalmology* in the year 1859.

The names of many great men—Beer, Jager, Arlt, Sichel, des Marres, de Wecker, Scarpa, Potts, and Langenbeck—fall between the periods of Daviel and von Graefe. Some of them had improved methods or improved instruments; others, such as Potts and Langenbeck, actually strove to turn back the hands of the clock and advocated passionately recination and kerato-nyxis.

To the Austrian school of Beer, Jager, Rosas, and Arlt belongs finally the great credit of having formally established the extraction of the cataract in opposition to the reversal to antiquated methods which threatened to nullify Daviel's efforts.

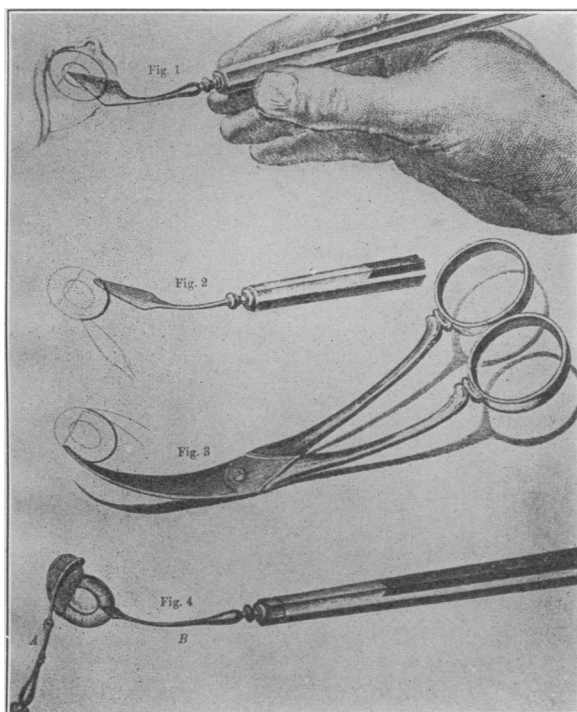
The extractions of today are well known to us all. The extraction in capsule by Smith's method, or by Barraquer's; the lifting out of the lens by appropriately shaped forceps; the various modifications of conjunctival flaps and safety sutures—all these will in time form a historical study for the generation of ophthalmologists hundreds, perhaps thousands, of years from now.

Perhaps, if summed up, the high lights in the operation of cataract might be said to be the work and methods of the Arabians; the work of Brisseau and Daviel; the work of the Viennese school, and the work of von Graefe.

It was Anatole France who, on being reproached by a friend that his library contained only the works of the ancients, and that he paid scant courtesy to his colleagues by not including theirs, said:

"I know what *they think*. What I want to know is what those *before* me thought, and I would like to know what those after me will think."

516 Sutter Street.



Cataract operation of the 17th Century

the scientific bodies and academies of Europe. His death occurred in Geneva, probably due to cancer of the larynx. His grave there is surmounted by a monument erected to his honor by Swiss oculists.

His operation has been changed, in regard to the location of the incision, and has been changed in regard to the use of a single knife instead of the multiplicity of instruments. The problems dealing with the complications of extraction have been met and worked out during the 172 years since his time. The names and work of the many eminent men since that day form the concluding chapter toward the perfection of the operation.

The operation has been the subject of the closest attention and study, and has encountered an infinite number of modifications. And yet today, substituting for Daviel's knife and scissors the modified knife of Tenon of 1757, as represented in the von Graefe knife, making the incision upward, not downward, adding in appropriate cases the iredelectomy of von Graefe, we have still the classic operation of Daviel

Prevention as the Primary Duty of Physicians was Old Then as Now—It has become the imperative duty of every physician to be a preacher of the gospel of life and health, if he has any exalted appreciation of the aims and ends of his calling; and inasmuch as in the science of health there are more exact demonstrative truths than in the science of disease, so that duty demands, as it richly deserves, an unbounded share of our professional energy. As teachers in this nobler work of *prevention rather than cure*, we must not only show mankind what the laws of nature are, but how important is a strict adherence to them; in other words, we must, by every means in our power, by example as well as by precept, strive to advance them in the scale of intelligent beings. (From President T. M. Logan's Address at the First Annual Meeting of the Medical Society of the State of California, October 11, 1871.)